

REMARKS

Claims 1, 3-7, 10-12, 14, 16-18 and 21-24 are pending in the Application and are now presented for examination. Claims 1, 3, 5, 7, 10, 12, 14, 16-18 and 21-24 have been amended. Claims 2, 8, 9, 13, 15, 19 and 20 have been cancelled, without prejudice and without disclaimer of subject matter. No new matter has been added.

Claims 1, 14 and 21 are independent.

On page 4 of the Office Action, Claims 1, 4-7, 10-14, 17-19 and 21-24 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent #5,185,667 A (Zimmermann) in view of Japanese Laid-Open Patent Application 10-134, 187A (House). Applicants respectfully disagree. Claims 13 and 19 have been cancelled, rendering the rejections to these claims moot.

Features of amended Claim 1 include an image data processor that “transform[s] distorted wide angle image data into substantially *undistorted* image data on a pixel-by-pixel basis;” and an encoder that is “configured to receive and encode the substantially undistorted image data,” where the substantially undistorted image data is “not [] stored in a buffer from the time of transformation by the image data processor until the time said encoder produces an output signal, said output signal being produced substantially in *real time*” (emphasis added). Neither Zimmerman, nor House, whether considered separately or in combination, teach, suggest or disclose these features.

The claimed invention provides an advantage over conventional systems which typically require an output buffer to store the transformed data before sending the data to the encoder. Having an output buffer increases the overall cost of the system and increases signal latency. Claim 1 advantageously avoids the drawbacks and disadvantages of the prior art by providing an

“encoder [that] produces an output signal ... substantially in real time,” thus eliminating the need to buffer the data before it is sent to the encoder, i.e., not “stor[ing] the data] in a buffer from the time of transformation by the image data processor until the time said encoder produces an output signal.” The image data processor transforms the distorted wide angle image data on a pixel-by-pixel basis, as the data for a pixel *is needed* for encoding. The distorted wide angle video image data can be transformed into, for example, two dimensional data. The transformation calculations are started far enough in advance such that the final calculation step is completed *just in time* to provide undistorted image data to the encoder, eliminating the need for an output image buffer. The transformation generates the required undistorted pixel data in a *timely manner*, as the data for a pixel is required by the encoder to “produce[] output signals ... substantially in *real time*.” As such, the data is “not being stored in a buffer from the time of transformation by the image data processor until the time said encoder produces an output signal, said output signal being produced substantially in real time.”

As an initial matter, the Office Action states that Zimmerman does not teach or suggest “transform[ing] . . . wide angle image data . . . on a pixel-by-pixel basis.” Applicants agree with this proposition.

House also does not teach or suggest these features. In striking contrast to amended Claim 1, House merely shows “a wide visual field image and a narrow visual field image . . . converted into images whose pixel units are equal in magnitude.” See Abstract. The Office Action relies on ¶ [0064] of House to attempt to show Applicants’ claimed feature of data “not being stored in a buffer from the time of transformation by the image data processor until the time said encoder produces an output signal, said output signal being produced substantially in

real time.” House shows that “estimated depth values are outputted as a depth image 11 to the outside.” House ¶ [0064]. However, House does not mention not using a buffer, and so, the Office Action relies on House’s “to the outside,” attempting to show that there is no buffer. Applicants respectfully assert that the Office Action speculates as to the meaning “to the outside,” and speculates that House outputs the depth values to the outside without buffering.

The Office Action assumes this speculation to be true without conclusive evidence. The Office Action is reading a feature in House that is simply not disclosed. In addition, House uses a “depth picture formation section” to estimate the depth, “and output is made to the outside as the depth picture 11.” House ¶ [0064]. Nothing is said about not using “a buffer” or an encoder “produc[ing] an output signal ... in substantially real time.” For at least this reason, Applicants respectfully assert that Claim 1 is patentable over House.

Also, with respect to the feature of Claim 1 that recites “transform *distorted* wide angle image data into substantially undistorted image data on a pixel-by-pixel basis”, the Office Action relies on ¶ [0076-0077] to show a pixel wise transformation of wide angle image data. House shows that “a picture mapping device ... outputs a depth picture after inputting the wide visual field picture 5 and the narrow visual field picture 6.” House, ¶ [0039]. In House “the wide visual field image ... is enlarged so that the magnitude of a pixel unit thereof may coincide with that of the narrow visual field image.” ¶ [0077]. House uses a wide visual field image to output an image where the magnitude of the pixels coincide with the narrow visual field image. Nevertheless, House does not show that the wide visual field image is *distorted*. On the contrary, pictures 5 and 6 shown on FIGS. 1, 3 and 4 are not distorted. As such, House does not solve the problem of distorted images created by wide angle lenses which distort images by

curving or warping objects. Typically, the wider the field of view for a lens, the more pronounced the distortion will be. House says nothing about substantially reducing the wide angle image distortion by, for example, using mathematical algorithms to create a substantially undistorted image data. Moreover, the Office Action admits that House requires two inputs, the wide visual field picture and the pixel unit image, in order to produce one output: the depth image. Creating an output from one input is different than creating an output by comparing two inputs. Applicants respectfully assert that nothing in House discloses a system that “transform[s] distorted ... data into *substantially undistorted* ... data.” For at least this additional reason, Applicants respectfully assert that Claim 1 is patentable over House.

For at least all of the above reasons, Applicants respectfully assert that neither Zimmerman, nor House, whether considered alone or in combination, teach, disclose or suggest all of the features of Claim 1. Applicants believe Claim 1 is patentable over House and Zimmermann, and respectfully request the withdrawal of this rejection.

Amended Claims 14 and 21 recite features similar to amended Claim 1. Specifically, amended Claim 14 recites the features of “transforming the distorted wide-angle image data into substantially undistorted image data on a pixel-by-pixel basis . . . without buffering the substantially undistorted image data ... [and] output signals being produced substantially in real time.” Amended Claim 21 recites the features of “transforming distorted wide angle image data into substantially undistorted image data on a pixel-by-pixel basis; ... without storing the substantially undistorted image data in a buffer ... the encoder means producing an output signal, said output signal being produced substantially in real time.” As explained above, these features are not taught, disclosed or suggested by Zimmerman or House, whether considered alone or in

combination. Applicants respectfully assert that these claims are patentable over the cited art, and request the withdrawal of the rejections to these claims.

Claims 4-7, 10-12, 17-18, and 22-24 are each dependent either directly or indirectly from one or another of independent Claims 1, 14 and 21, discussed above. These claims recite additional limitations which, in conformity with the features of their corresponding independent claim, are not disclosed or suggested by the art of record. The dependent claims are therefore believed patentable. However, the individual reconsideration of the patentability of each claim on its own merits is respectfully requested.

On page 7 of the Office Action, Claims 3 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zimmermann in view of House as applied to Claims 1 and 14 above, and further in view of US Patent No. 5,414,521 (Ansley). Applicants respectfully traverse. Claims 3 and 16 are each dependent directly from one or another of independent Claims 1 and 14, discussed above. These claims recite additional limitations which, in conformity with the features of their corresponding independent claim, are not disclosed or suggested by the art of record. The dependent claims are therefore believed patentable. However, the individual reconsideration of the patentability of each claim on its own merits is respectfully requested.

For all of the above reasons, the claim objections are believed to have been overcome placing Claims 1, 3-7, 10-12, 14, 16-18 and 21-24 in condition for allowance, and reconsideration and allowance thereof is respectfully requested.

Of note, Applicant's undersigned representative is registered to practice before the United States Patent & Trademark Office. In accordance with 37 C.F.R. § 1.34 and M.P.E.P. § 405, the signature of Applicant's undersigned representative is representation that he is authorized to represent Applicant and the assignee on whose behalf he is acting.

The Examiner is encouraged to telephone the undersigned to discuss any matter that would expedite allowance of the present application.

The Commissioner is hereby authorized to credit overpayments or charge payment of any additional fees associated with this communication to Deposit Account No. 502104.

Respectfully submitted,

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